

LISTING OF CLAIMS

This listing of claims will replace all prior versions, and listings; of claims in the application:

- Claim 1 (canceled)
2. (previously presented) A method according to claim 27, 28, or 30, wherein said first and second oligonucleotides comprise oligonucleotides of known sequence.
3. (previously presented) A method according to claim 27, 28, 29 or 30, wherein said first and second oligonucleotides are labeled.
4. (previously presented) A method according to claim 3, wherein said first and second oligonucleotides bear different labels.
5. (previously presented) A method according to claim 27, 28 or 29, wherein said first and second oligonucleotides are attached covalently through said first and second linkers respectively, to said substrate.
6. (previously presented) A method according to claim 27, 28 or 29, wherein said first and second oligonucleotides are synthesized on said substrate.
7. (previously presented) A method according to claim 27 or 30, wherein said substrate comprises discrete sites to which said first and second oligonucleotides may be linked.
8. (original) A method according to claim 7, wherein said first and second oligonucleotides are immobilized to first and second beads through first and second linkers, respectively, and wherein said first and second beads are distributed at said discrete sites.
9. (previously presented) A method according to claim 27, 29 or 30, further comprising synthesizing said first and second oligonucleotides on said substrate.
10. (original) The method according to claim 9, wherein said first and second oligonucleotides are synthesized by a synthesis method selected from the group consisting of printing and photolithography.

Claims 11-26 (canceled)

27. (currently amended) A method for multiplex detection of target nucleic acids comprising:

- a) providing a substrate comprising at least first and second different oligonucleotides linked to said substrate through first and second cleavable linkers, respectively;
- b) cleaving said first and second linkers, thereby releasing said first and second oligonucleotides from said substrate thereby generating a pool of oligonucleotides comprising said first and second different oligonucleotides; ~~and~~
- c) contacting said first and second oligonucleotides with a composition comprising at least a first and second target nucleic acid, whereby said first and second target nucleic acids hybridize with said first and second oligonucleotides;
- d) modifying said first or second oligonucleotides hybridized with said first and second target nucleic acids to produce modified first or second oligonucleotides, and
- e) contacting said modified first or second oligonucleotides with a substrate comprising at least first and second different oligonucleotides, whereby said target nucleic acids are detected.

28. (currently amended) A method for multiplex detection of target nucleic acids comprising:

- a) providing an array comprising a substrate and a population of oligonucleotides, said population comprising at least first and second subpopulations comprising at least first and second different oligonucleotides, respectively, said first and second oligonucleotides being immobilized to first and second beads, respectively, through first and second cleavable linkers respectively, said first and second beads being distributed on said substrate;
- b) cleaving said first and second linkers, thereby releasing said first and second subpopulations from said first and second beads, thereby generating a pool of oligonucleotides comprising said first and second different oligonucleotides; ~~and~~
- c) contacting said first and second oligonucleotides with a composition comprising at least a first and second target nucleic acid, whereby said first and second target nucleic acids hybridize with said first and second oligonucleotides;

d) modifying said first or second oligonucleotides hybridized to said first and second target nucleic acids to produce modified first or second oligonucleotides, and

e) contacting said modified first or second oligonucleotides with an array comprising a substrate and a population of oligonucleotides comprising at least first and second subpopulations comprising at least first and second different oligonucleotides, respectively,
whereby said target nucleic acids are detected.

29. (currently amended) A method for multiplex detection of target nucleic acids comprising:

a) providing an array comprising a substrate and a population of oligonucleotides, said population comprising at least first and second subpopulations, wherein said first subpopulation comprises at least a first oligonucleotide and, wherein said second subpopulation comprises at least a second oligonucleotide, wherein said first oligonucleotide is different from said second oligonucleotide and, wherein said first and second oligonucleotides are of known sequence, said first and second oligonucleotides being immobilized directly to said substrate through first and second cleavable linkers, respectively;

b) cleaving said first and second linkers, thereby releasing said first and second subpopulations from said substrate thereby generating a pool of oligonucleotides comprising said first and second oligonucleotides; and

c) contacting said first and second oligonucleotides with a composition comprising at least a first and second target nucleic acid, whereby said first and second target nucleic acids hybridize with said first and second oligonucleotides;

d) modifying said first or second oligonucleotides hybridized with said first and second target nucleic acids to produce modified first or second oligonucleotides, and

e) contacting said modified first or second oligonucleotides with an array comprising a substrate and a population of oligonucleotides comprising at least first and second subpopulations, wherein said first subpopulation comprises at least a first oligonucleotide and, wherein said second subpopulation comprises at least a second oligonucleotide, wherein said first oligonucleotide is different from said second oligonucleotide and, wherein said first and second oligonucleotides are of known sequence, whereby said target nucleic acids are detected.

30. (currently amended) A method for multiplex detection of target nucleic acids comprising:

a) cleaving at least first and second different oligonucleotides linked to a substrate through at least a first cleavable linker from said substrate, thereby releasing said first and second oligonucleotides from said substrate generating a pool of oligonucleotides comprising said first and second different oligonucleotides; and

b) contacting said first and second oligonucleotides with a composition comprising at least a first and second target nucleic acid, whereby said first and second target nucleic acids hybridize with said first and second oligonucleotides;

c) modifying said first or second oligonucleotides hybridized with said first and second target nucleic acids to produce modified first or second oligonucleotides, and

d) contacting said modified first or second oligonucleotides with a substrate comprising at least first and second different oligonucleotides, whereby said target nucleic acids are detected.

31. (previously presented) The method according to claim 30, wherein said first and second oligonucleotides are attached covalently through said cleavable linker to said substrate.

32. (canceled)

33. (currently amended) A method for multiplex detection of target nucleic acids comprising:

a) providing a substrate comprising at least first and second different oligonucleotides linked to said substrate through first and second cleavable linkers, respectively;

b) cleaving said first and second linkers, thereby releasing said first and second oligonucleotides from said substrate thereby generating a pool of oligonucleotides comprising said first and second different oligonucleotides;

c) contacting said first and second oligonucleotides with a first and second target nucleic acid; and

d) modifying said first or second oligonucleotides contacted with said first and second target nucleic acid to produce modified first or second modified oligonucleotides;

- e) contacting said modified first or second oligonucleotides with a substrate comprising at least first and second different oligonucleotides, and
- f) detecting said target nucleic acid.

34. (currently amended) A method for multiplex detection of target nucleic acids comprising:

- a) providing an array comprising a substrate and a population of oligonucleotides, said population comprising at least first and second subpopulations comprising at least first and second different oligonucleotides, respectively, said first and second oligonucleotides being immobilized to first and second beads, respectively, through first and second cleavable linkers respectively, said first and second beads being distributed on said substrate;

- b) cleaving said first and second linkers, thereby releasing said first and second subpopulations from said first and second beads, thereby generating a pool of oligonucleotides comprising said first and second different oligonucleotides;

- c) contacting said first and second oligonucleotides with a first and second target nucleic acid; and

- d) modifying said first or second oligonucleotides contacted with said first and second target nucleic acid to produce modified first or second oligonucleotides;

- e) contacting said modified first or second oligonucleotides with an array comprising a substrate and a population of oligonucleotides comprising at least first and second subpopulations comprising at least first and second different oligonucleotides, respectively, and

- e) detecting said target nucleic acids.

35. (currently amended) A method for multiplex detection of target nucleic acids comprising:

- a) cleaving at least first and second different oligonucleotides linked to a substrate through at least a first cleavable linker from said substrate, thereby releasing said first and second oligonucleotides from said substrate generating a pool of oligonucleotides comprising said first and second different oligonucleotides; and

- b) contacting said first and second oligonucleotides with a first and second target nucleic acid; and

c) modifying said first or second oligonucleotides contacted with said first and second target nucleic acid to produce modified first or second oligonucleotides, and

d) contacting said modified first or second oligonucleotides with a substrate comprising at least first and second different oligonucleotides, and

d) detecting said target nucleic acids.

36. (previously presented) The method according to claim 27, 34 or 35, wherein said substrate is selected from the group consisting of glass, plastics, polysaccharides, nylon, nitrocellulose resins, silica, silicon, carbon, and metals.

37. (previously presented) The method according to claim 29, wherein said substrate comprises a chip.

38. (new) The method of claim 27, wherein said modifying step comprises amplification of said first or second target nucleic acids.

49. (new) The method of claim 27, wherein said modifying step comprises an assay selected from oligonucleotide ligation assay (OLA), single base extension (SBE), Invader, polymerase chain reaction (PCR) and sequencing.

40. (new) The method of claim 28, wherein said modifying step comprises amplification of said first or second target nucleic acids.

41. (new) The method of claim 28, wherein said modifying step comprises an assay selected from oligonucleotide ligation assay (OLA), single base extension (SBE), Invader, polymerase chain reaction (PCR) and sequencing.

42. (new) The method of claim 29, wherein said modifying step comprises amplification of said first or second target nucleic acids.

43. (new) The method of claim 29, wherein said modifying step comprises an assay selected from oligonucleotide ligation assay (OLA), single base extension (SBE), Invader, polymerase chain reaction (PCR) and sequencing.

44. (new) The method of claim 30, wherein said modifying step comprises amplification of said first or second target nucleic acids.

45. (new) The method of claim 30, wherein said modifying step comprises an assay selected from oligonucleotide ligation assay (OLA), single base extension (SBE), Invader, polymerase chain reaction (PCR) and sequencing.

46. (new) The method of claim 33, wherein said modifying step comprises amplification of said first or second target nucleic acids.

47. (new) The method of claim 33, wherein said modifying step comprises an assay selected from oligonucleotide ligation assay (OLA), single base extension (SBE), Invader, polymerase chain reaction (PCR) and sequencing.

48. (new) The method of claim 34, wherein said modifying step comprises amplification of said first or second target nucleic acids.

49. (new) The method of claim 34, wherein said modifying step comprises an assay selected from oligonucleotide ligation assay (OLA), single base extension (SBE), Invader, polymerase chain reaction (PCR) and sequencing.

50. (new) The method of claim 35, wherein said modifying step comprises amplification of said first or second target nucleic acids.

51. (new) The method of claim 35, wherein said modifying step comprises an assay selected from oligonucleotide ligation assay (OLA), single base extension (SBE), Invader, polymerase chain reaction (PCR) and sequencing.

51. (new) A method for multiplex detection of target nucleic acids comprising:
a) providing a substrate comprising at least first and second different oligonucleotides linked to said substrate through first and second cleavable linkers, respectively;
b) cleaving said first and second linkers, thereby releasing said first and second oligonucleotides from said substrate thereby generating a pool of oligonucleotides comprising said first and second different oligonucleotides;

c) contacting said first and second oligonucleotides with a first and second target nucleic acid;

d) contacting said first and second target nucleic acids in contact with said first and second target nucleic acid with a substrate comprising at least first and second different oligonucleotides, and

e) detecting said target nucleic acid.

52. (new) A method for multiplex detection of target nucleic acids comprising:

a) providing an array comprising a substrate and a population of oligonucleotides, said population comprising at least first and second subpopulations comprising at least first and second different oligonucleotides, respectively, said first and second oligonucleotides being immobilized to first and second beads, respectively, through first and second cleavable linkers respectively, said first and second beads being distributed on said substrate;

b) cleaving said first and second linkers, thereby releasing said first and second subpopulations from said first and second beads, thereby generating a pool of oligonucleotides comprising said first and second different oligonucleotides;

c) contacting said first and second oligonucleotides with a first and second target nucleic acid;

d) contacting said first and second oligonucleotides in contact with said first and second target nucleic acid with an array comprising a substrate and a population of oligonucleotides comprising at least first and second subpopulations comprising at least first and second different oligonucleotides, respectively, and

e) detecting said target nucleic acids.